1. (Currently Amended) A non-invasive method for use in determining at least one desired characteristic of blood of a patient, the method comprising:

(a) creating a condition of artificial blood kinetics at a measurement location in a patient's blood perfused fleshy medium and maintaining this condition for a certain time period;

(b) applying an external electromagnetic field to the measurement location;

(c) detecting a time response of the medium from at least a portion of the measurement location to said external electromagnetic field, the response including at least one of an acoustic response to illuminating incident light having a wavelength in a range where the scattering properties of blood are sensitive to light radiation or an impedance of the portion of the medium;

(d) generating measured data indicative of time evolutions of the response of the medium over at least a part of said certain time period;

(e) analyzing said measured data for determining at least one characteristic parameter derived from said time response of the medium, the characteristic parameter including at least one of an actual value of the time response at a certain moment, during said certain time period, chosen when the response attains its near asymptotic magnitude; and a parametric slope defined as a ratio between a first function depending on a time response of the medium corresponding to a first frequency of the external electromagnetic field or a second function depending on the time response of the medium corresponding to a second frequency;

(f) providing predetermined reference data sensitive to patient individuality and indicative of the desired blood characteristic obtained by other independent method as a function of said at least one characteristic parameter; and

(g) utilizing the determined characteristic parameter derived from said time response of the medium and said predetermined reference data for obtaining a value of the desired blood characteristic.

2. (Canceled)

3. (Original) The method of claim 1 further comprising:

altering said condition of the artificial blood kinetics at the measurement location over a predetermined time interval within said certain time period so as to modulate properties of the blood affecting said time response.

4. (Canceled)

5. (Currently Amended) The method of claim 1, wherein said reference data is a calibration curve defining a dependence of the characteristic parameter on the desired blood characteristic.

6. (Canceled)

7. (Canceled)

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Canceled)

12. (Canceled)

13. (Currently Amended) The method of claim 1, wherein said first and second functions are logarithmic functions of the response corresponding to the first and second frequencies, respectively.

14. (Canceled)

15. (Currently Amended) The method of claim 1, wherein said first and second functions are a time rate of the changes of the response corresponding to the first and second frequencies, respectively.

16. (Canceled)

17. (Original) The method of claim 1 wherein said creating of the condition of artificial kinetics includes applying primary over-systolic pressure to a certain location at the medium with a normal blood flow upstream of the measurement location so as to achieve a state of temporary blood flow cessation in the medium at the measurement location.

18. (Original) The method of claim 1 wherein said certain time period is insufficient for irreversible changes in the fleshy medium.

19. (Original) The method of claim 3 wherein said altering of the condition of artificial blood kinetics includes applying a perturbation to the medium by at least one secondary pressure pulse of a predetermined value over said predetermined time interval.

20. (Original) The method of claim 19 wherein the predetermined value of the secondary pressure is in the range of about 0-300 mmHg.

21. (Original) The method of claim 3 wherein said altering of the condition of artificial blood kinetics includes applying a perturbation to the medium by secondary pressure of a predetermined cyclic pattern over said predetermined time interval.

22. (Original) The method of claim 21 wherein said predetermined cyclic pattern is in the form of secondary pressure pulses having amplitudes in the range of about 0-300 mmHg.

23. (Original) The method of claim 1 wherein said at least one desired characteristic of the patient's blood is a concentration of glucose therein.

24. (Currently Amended) A system for non-invasive determination of at least one desired characteristic of blood of a patient, the system comprising:

(i) a pressurizing assembly arranged for creating a condition of artificial blood kinetics at a measurement location in a patient's blood perfused fleshy medium and at least maintaining this condition for a certain time period, the pressurizing assembly comprising a primary occlusion cuff for applying a primary over-systolic pressure to the fleshy medium at a primary pressure location, and a secondary occlusion cuff for applying a secondary pressure to the flesh medium at a secondary pressure location, thereby altering the condition of the artificial blood kinetics at said secondary pressure location over a predetermined time interval within said certain time period so as to modulate properties of the blood affecting said time response;

(ii) a measuring probe including

a source of an external electromagnetic field configured for applying said external electromagnetic field to said measurement location, and

a detecting module configured for detecting a time response of the medium from at least a portion of the measurement location to said external electromagnetic field; and

(iii) a control unit electrically coupled to said pressurizing assembly, said control unit including:

a memory for storing reference data sensitive to patient individuality and indicative of the desired blood characteristic as a function of a characteristic parameter derived from said time response; and

a data acquisition and processing utility coupled to the detecting module for receiving and analyzing measured data therefrom and configured to utilize the reference data and determine said at least one desired blood characteristic.

25. (Currently Amended) The system of claim ~~24~~37, wherein said pressurizing assembly includes a primary occlusion cuff for applying a primary over-systolic pressure to the fleshy medium at a primary pressure location.

26. (Original) The system of claim 25 wherein said pressurizing assembly further includes a secondary occlusion cuff for applying a secondary pressure to the flesh medium at a secondary pressure location, thereby altering said condition of the artificial blood kinetics at said secondary pressure location over a predetermined time interval within said certain time period so as to modulate properties of the blood affecting said time response.

27. (Currently Amended) The system of claim ~~26~~24, wherein said primary pressure location is selected upstream of the secondary pressure location with respect to the normal blood flow direction in the medium, said secondary pressure location being in the vicinity of the measurement location.

28. (Original) The system of claim 24 wherein said measuring probe includes a photo-acoustic system, where said source of the external electromagnetic field being configured for generating a light beam in the wavelength range where the scattering or absorbing properties of the patients blood are sensitive to provide an acoustic response, and where said detecting module is an acoustic detector.

29. (Original) The system of claim 24 wherein said measuring probe includes a system for measuring impedance of at least a portion of the medium at the measurement location.

30. (Original) The system of claim 24 wherein said reference data is a calibration curve defining a dependence of the characteristic parameter on the desired blood characteristic.

31. (Original) The system of claim 30 wherein said at least one characteristic parameter is an actual value of the time response at a certain moment during said certain time period.

32. (Original) The system of claim 31 wherein said certain moment is chosen when the response attains its near asymptotic magnitude.

33. (Original) The system of claim 24 wherein said characteristic parameter is a parametric slope defined as a ratio between a first function depending on a time response of the medium corresponding to a first frequency of the external electromagnetic field and a second function depending on the time response of the medium corresponding to a second frequency.

34. (Original) The system of claim 33 wherein said first and second functions are logarithmic functions of the response corresponding to the first and second frequencies, respectively.

35. (Original) The system of claim 33 wherein said first and second functions are a time rate of the changes of the response corresponding to the first and second frequencies, respectively.

36. (Original) The system of claim 24 wherein said at least one desired characteristic of the patient's blood is a concentration of glucose therein.

Please add the following claims.

37. (New) A system for non-invasive determination of at least one desired characteristic of blood of a patient, the system comprising:

(i) a pressurizing assembly arranged for creating a condition of artificial blood kinetics at a measurement location in a patient's blood perfused fleshy medium and at least maintaining this condition for a certain time period;

(ii) a measuring probe comprising

a source of an external electromagnetic field configured for applying said external electromagnetic field to said measurement location, said source of the external electromagnetic field being configured for generating a light beam in the

wavelength range where the scattering or absorbing properties of the patients blood are sensitive to provide an acoustic response, and

a detecting module comprising an acoustic detector configured for detecting a time response of the medium from at least a portion of the measurement location to said external electromagnetic field; and

(iii) a control unit electrically coupled to said pressurizing assembly, said control unit comprising

a memory for storing reference data sensitive to patient individuality and indicative of the desired blood characteristic as a function of a characteristic parameter derived from said time response; and

a data acquisition and processing utility coupled to the detecting module for receiving and analyzing measured data therefrom and configured to utilize the reference data and determine said at least one desired blood characteristic.

38. (New) The system of claim 26 wherein said primary pressure location is selected upstream of the secondary pressure location with respect to the normal blood flow direction in the medium, said secondary pressure location being in the vicinity of the measurement location.

39. (New) The system of claim 37 wherein said measuring probe includes a system for measuring impedance of at least a portion of the medium at the measurement location.

40. (New) The system of claim 37 wherein said reference data is a calibration curve defining a dependence of the characteristic parameter on the desired blood characteristic.

41. (New) The system of claim 40 wherein said at least one characteristic parameter is an actual value of the time response at a certain moment during said certain time period.

42. (New) The system of claim 41 wherein said certain moment is chosen when the response attains its near asymptotic magnitude.

43. (New) The system of claim 37 wherein said characteristic parameter is a parametric slope defined as a ratio between a first function depending on a time response of the medium corresponding to a first frequency of the external electromagnetic field and a second function depending on the time response of the medium corresponding to a second frequency.

44. (New) The system of claim 43 wherein said first and second functions are logarithmic functions of the response corresponding to the first and second frequencies, respectively.

45. (New) The system of claim 43 wherein said first and second functions are a time rate of the changes of the response corresponding to the first and second frequencies, respectively.

46. (New) The system of claim 37 wherein said at least one desired characteristic of the patient's blood is a concentration of glucose therein.